Natural Resources

A Self-guided Tour of The Fish Ladder
Visitor Orientation Building, Washington

Use this as a guide to the fish ladder at the second powerhouse.

Stop #1: Go down the escalator in the Visitor Orientation Building to the Fish Ladder. Walk along the fish ladders and see if you can pick out the different sections.

Stop #2: Go To The Fish Viewing Building.

Go down to the lower floor of the Fish Viewing Building. The windows you are looking through give you a view into the fish ladder.

Which way are the fish moving in the ladder?

- ❑ a. against the current
- ❑ b. with the current

Where are the fish in the ladder going after they pass the dam?

- ❑ a. upriver
- ❑ b. downriver

Is the fish ladder used mostly by adult fish or juvenile fish? _____

Why do the fish in the ladder have to get past Bonneville Dam? _____

Stop #3: Look At The Fish Count.

Which fish are counted?

1._____ 2. _____ 3. _____

4. _____ 5. _____ 6. _____

7. _____

Why are the fish counted? _____

Stop #4: Look At The Migratory Patterns Exhibit.

Columbia River Chinook spend _____ or _____ years at sea.

Stop #5: Look At The Models Of The Fish.

Name five kinds of fish seen in the ladder.

1. _____ 2. _____ 3._____

4. _____ 5. _____

Use the models of the fish to help you identify the fish.

Stop #6: Go Upstairs To The Exhibit About Early Fishing.

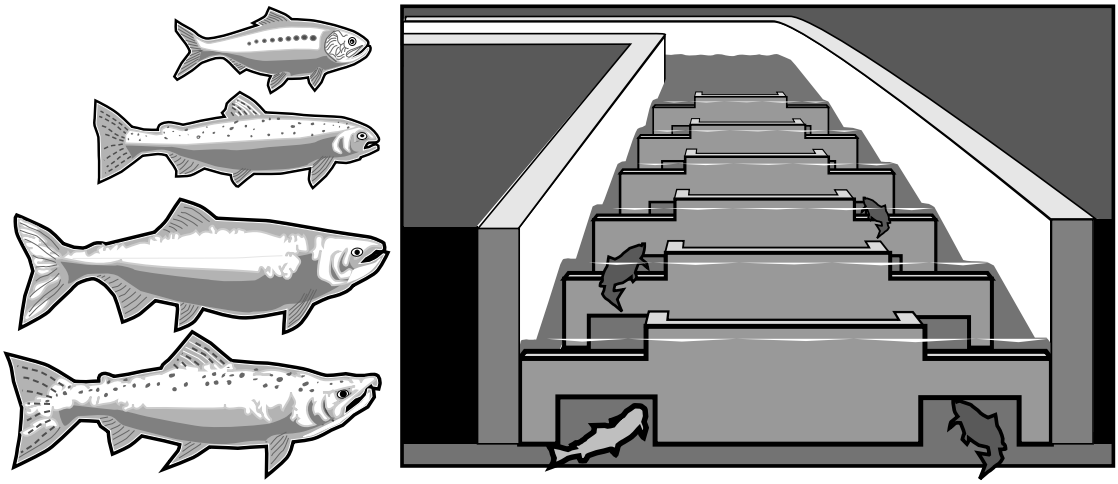
Who were the first people to fish in the Columbia River?

Bonus Question

The fish ladders are used mostly by the adult fish going upstream to spawn. Can you name two ways, other than the ladders, juvenile fish can get downstream past the dam?

1. _____ 2. _____

If you have questions about fish or fish ladders, please ask at the information desk.



A Self-guided Tour of The Fish Ladder
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Answers:

Use this as a guide to the fish ladder at the second powerhouse.

Stop #1: Go down the escalator in the Visitor Orientation Building to the Fish Ladder. Walk along the fish ladders and see if you can pick out the different sections.

Stop #2: Go To The Fish Viewing Building.

Go down to the lower floor of the Fish Viewing Building. The windows you are looking through give you a view into the fish ladder.

Which way are the adult fish going in the ladder?

b. against the current

Where are the fish in the ladder going after they pass the dam?

a. upriver

Is the fish ladder used mostly by adult fish or juvenile fish? **adult fish**

Why do the fish in the ladder have to get past Bonneville Dam**?**
They spawn in the same place they were reared which could be hundreds of miles past Bonneville Dam.

Stop #3: Look At The Fish Count.

Which fish are counted?

1. **chinook**
2. **coho**
3. **steelhead**
4. **chinook jack**
5. **shad**
6. **sockeye**
7. **coho jack**

Why are the fish counted? **The fish count helps set regulations, guide hatchery production and assists research.**

Stop #4: Look At The Migratory Patterns Exhibit.

Columbia River Chinook spend **one** or **six** years at sea.

Stop #5: Look At The Models Of The Fish.

Name five kinds of fish seen in the ladder.

1. **chinook salmon** 2. **coho salmon** 3. **shad**
4. **steelhead trout** 5. **sockeye salmon**

Use the models of the fish to help you identify the fish.

Stop #6: Go Upstairs To The Exhibit About Early Fishing.

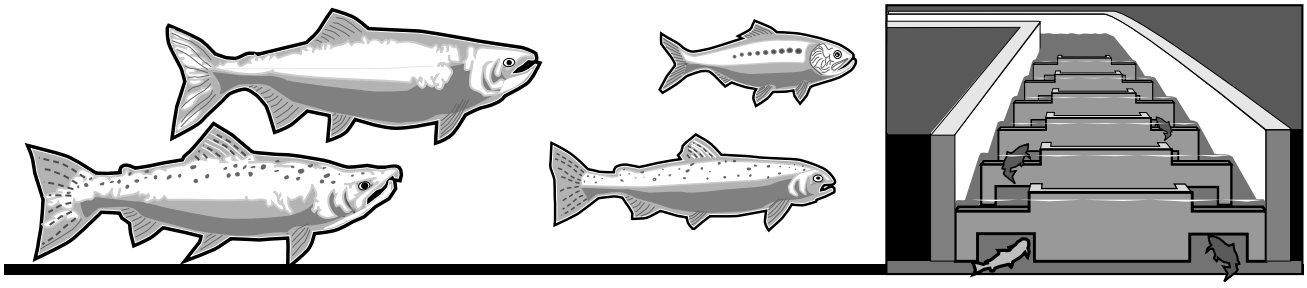
Who were the first people to fish in the Columbia River? **Native Americans**

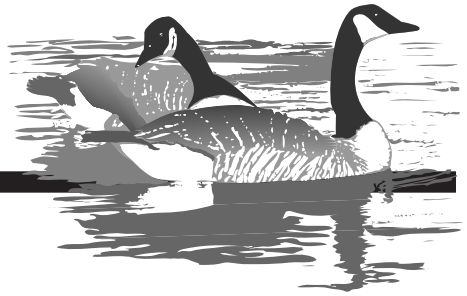
Bonus Question

The fish ladders are used mostly by the adult fish going upstream to spawn. Can you name two ways, other than the ladders, juvenile fish can get downstream past the dam?

1. **Many go over the spillway which is opened in the spring.**
2. **The fingerlings are collected at dams and hatcheries upriver then trucked and barged downriver to be released into the river just below Bonneville Dam.**

If you have questions about fish or fish ladders, please ask at the information desk.





Charting Resources

The Corps of Engineers has the job of managing, or taking care of, some of the natural resources found at the dam. While you are at Bonneville Dam, use this page to make a list of the natural resources you see.

Fill In The Chart Below:

Name of The Natural Resource	What Have People Done To It?	What Can We Do To Take Care of It?
Example: GEESE	When the dam was built and the water rose behind it, some nesting sites were flooded but other nesting sites were formed.	During nesting season we can control the water level in the river to make sure that nesting sites are not flooded.

Animal Checklist:

Animals are important natural resources. The animals listed below are often seen at or near Bonneville Dam. Put a check by each of the animals you see during your visit and write a description of what it looks like.

_____ osprey _____

_____ gull _____

_____ Canada goose _____

_____ deer _____

_____ elk _____

_____ coyote _____

_____ beaver _____

_____ squirrel _____

_____ mink _____

_____ other _____

_____ other _____

Natural Resource Management After Your Visit

The following activities are suggested for after your visit to Bonneville Dam. These are intended to reinforce what has been learned before and during your visit.

Activities

Make A Fish Mobile:

Use drawings of salmon, cardboard to reinforce them, and some sticks and string to make a hanging fish mobile. This will be a good reminder of your visit to Bonneville Dam. Sporting magazines could be a source of pictures.

Fishing For Facts:

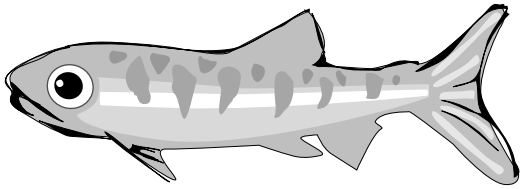
Quiz your students with the enclosed sheet labeled, "Fishing for Facts."

Managing A Resource:

This is a role playing activity designed to highlight the difficult decisions that must be made to manage a natural resource and the trade-offs that occur.

Fill In The Blanks Naturally:

This fill-in-the-blank activity will help students define "natural resource."



Fishing For Facts

Match the following by writing the number of the word in front of the correct definition.

Fishy Words		Fishy Definitions
1) Anadromous	_____	A place where people raise fish
2) Corps of Engineers	_____	A passageway around a dam for adult fish going upstream
3) Fish Bypass Channel	_____	A fish that is born in a river, migrates to the ocean, then returns to the river to spawn
4) Operation Fish Run	_____	A passageway for fish migrating downstream past a dam
5) Fish Counter	_____	Young salmon are brought past dams in barges and trucks to increase their chances of survival
6) Fish Ladder	_____	The government agency which built and operates Bonneville Dam
7) Hatchery	_____	A word for salmon reproduction
8) Spawning	_____	A person who counts fish at Bonneville Dam

True Or False

Here are some true and false questions to answer:

Small young salmon which are about as long as your finger are called fingerlings. _____

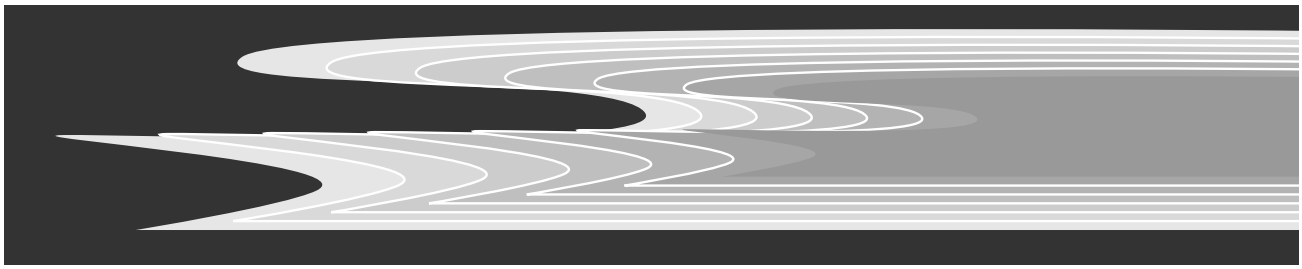
Adult salmon swimming in the river are usually going against the current. _____

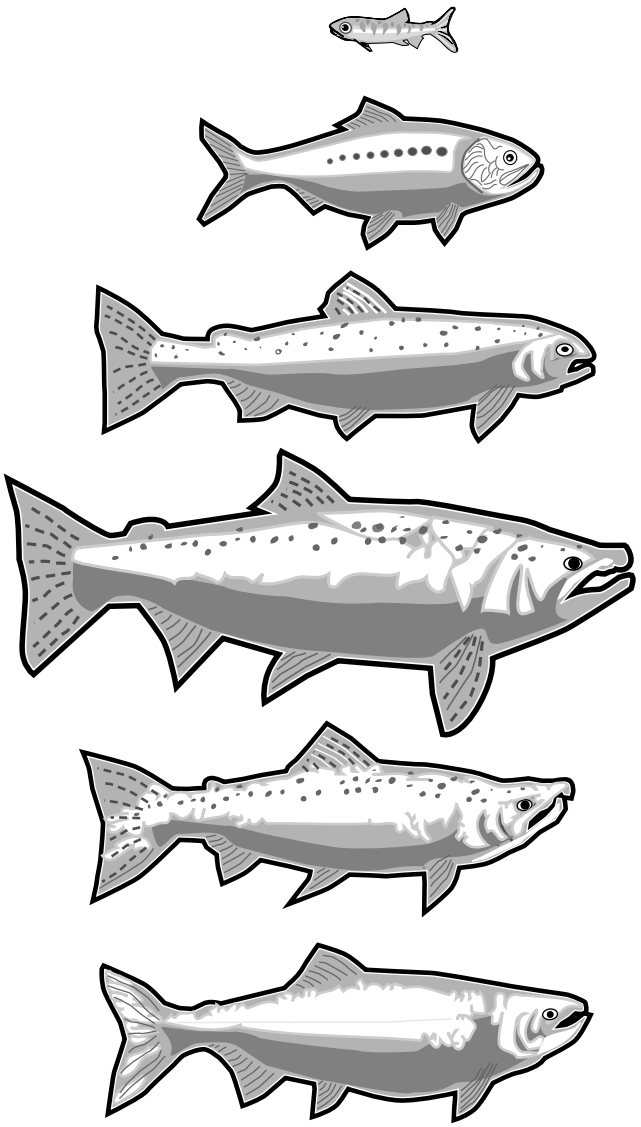
Salmon spawn two or three times. _____

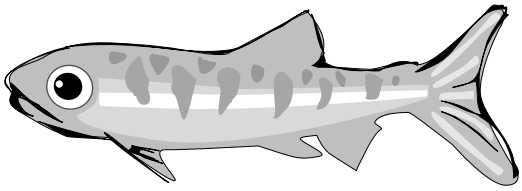
Smolts are young salmon which are migrating to the ocean. _____

Adult salmon eat a lot while swimming back up the river. _____

Salmon return to where they were hatched to reproduce (spawn). _____







Fishing For Facts

Answers: 7, 6, 1, 3, 4, 2, 8, 5

Match the following by writing the number of the word in front of the correct definition.

Fishy Words		Fishy Definitions
7) Hatchery	_____	**A place where people raise fish**
6) Fish Ladder	_____	**A passageway around a dam for adult fish going upstream**
1) Anadromous	_____	**A fish that is born in a river, migrates to the ocean, then returns to the river to spawn**
3) Fish Bypass Channel	_____	**A passageway for fish migrating downstream past a dam**
4) Operation Fish Run	_____	**Young salmon are brought past dams in barges and trucks to increase their chances of survival**
2) Corps of Engineers	_____	**The government agency which built and operates Bonneville Dam**
8) Spawning	_____	**A word for salmon reproduction**
5) Fish Counter	_____	**A person who counts fish at Bonneville Dam**

True Or False Answers

Small, young salmon which are about as long as your finger are called fingerlings. ..... **True**

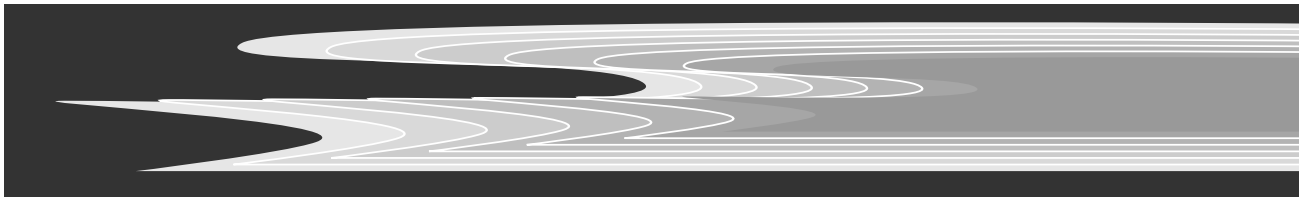
Adult salmon swimming in the river are usually going against the current. ..... **True**

Salmon spawn two or three times. ..... **False**

Smolts are young salmon which are migrating to the ocean. ..... **True**

Adult salmon eat a lot while swimming back up the river. ..... **False**

Salmon return to where they were hatched to reproduce (spawn). ..... **True**



Managing A Resource

This role playing activity will help students understand some of the problems associated with managing a resource. Select a student or group of students to represent each of the following special interest groups. The issue to be discussed is the building of a new navigation lock at Bonneville Dam.

The "Actors":

Engineer - You want to build this lock to provide efficient and safe passage of commercial and pleasure craft. You want to make it the best and least expensive possible.

The Tug Boat Owner - You want a new lock that will be the same size as the others locks upstream from the dam. The present lock is much smaller. This will make it easier and less expensive for goods to go upriver.

Historian - An important historical structure, located near the lock may have to be torn down. This building houses a gym, theater, meeting rooms and is architecturally unique. You want to save it.

Wildlife Biologist - Construction of the new lock may destroy some nesting areas for geese. You want to save these or at least have some new areas made which geese can use for nesting.

Construction Worker - You want the lock to be built so you will have a job!

Resource Manager - You want to protect all of the natural resources at Bonneville Dam. You also will be running this meeting.

Logger - You want to buy the trees which will be cut down to make room for the construction of the lock.

Get these people together to discuss protecting resources while planning the construction of the lock. The group should discuss what can be done to protect resources like the river, geese, trees, and animals in the area. One good point to make is that it is sometimes possible to damage one resource while protecting another.

Another good point is that managing resources is usually only necessary when people change the natural situation for some reason.

Fill In The Blanks Naturally

If you worked as a park ranger or natural resource manager you would have to know about protecting and managing natural resources. To give you an idea of some of the things you will have to know about, fill in the blanks below.

1. Natural resources are things found in nature that may be useful to us in some way.

   List four examples of natural resources found at or near Bonneville Dam including:

   a. two living _____ _____

   b. two non-living _____ _____

2. Give an example of how two of the above are connected and interdependent.

   _____

3. List two ways that people have changed natural resources at or near Bonneville Dam.

   _____

4. How have these changes affected other natural resources?

   _____

5. Trade-offs are decisions we make to trade the benefits of some things to gain increased benefits from others. With this in mind:

   List one trade-off made at the dam.

   _____

   For example: We trade a wild river for a series of reservoirs so that we can use water to meet a number of industrialized society's needs.

6. List one way the Corps of Engineers manages a resource.

   _____

7. List two ways you can help take care of natural resources.

   _____

8. List two jobs related to natural resources at a dam.

   _____

Fill In The Blanks Naturally

Answers:

1 Natural resources are things found in nature that may be useful to us in some way. List four examples of natural resources found at or near Bonneville Dam including:

a. two living **fish** **trees**

b. two non-living **air** **water**

2. Give an example of how two of the above are connected and interdependent.
Fish need cool water; trees need water. Trees that grow next to water help cool the water for the fish that live in it.

3. List two ways that people have changed natural resources at or near Bonneville Dam.
We have changed the river into a series of reservoirs. Most of the fish in the river are raised in hatcheries instead of the wild.

4. How have these changes affected other natural resources?
Flooding has been reduced, habitat has improved for some fish and the reservoirs provide additional food sources for the birds of prey.

5. Trade-offs are decisions we make to trade the benefits of some things to gain increased benefits from others. With this in mind:

List one trade-off made at a hydropower dam.
We trade an abundance of wild salmon for hatchery salmon so we can have electricity and other benefits associated with dams.

For example: We trade a wild river for a series of reservoirs so that we can use the water to meet a number of industrialized society's needs.

6. List one way the Corps of Engineers manages a resource.
The Corps builds dams so that the water resource can be used to meet a variety of society's needs.

7. List two ways you can help take care of natural resources.
conserve electricity, don't litter.

8. List two jobs related to natural resources at a dam.
park ranger, fish biologist.